AMENDMENTS TO THE CLAIMS:

The listing of claims below will replace all prior versions and listings of claims in the application:

Listing of Claims:

CLAIMS

1. (Original) A method for fine frequency-offset error determination in a radio receiver, comprising the steps of:

sampling an OFDM radio transmission;

assuming a coarse frequency offset after compensation by a previous circuit that will not exceed approximately ±10 kHz; and

using a cost function to determine a fine-frequency offset of said OFDM radio transmission for use in a subsequent circuit providing for frequency compensation of any fine-frequency offset.

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2. (Original) The method of Claim 1, further comprising the step of:

determining a coarse frequency offset of said OFDM radio transmission.

3. (Original) The method of Claim 1, further comprising the step of:

compensating any coarse frequency offset determined in a previous step to at worst approximately ±10 kHz.

4. (Currently Amended) The method of Claim 1, further comprising the step of:

finding a timing reference boundary between a short preamble and ~~said~~a long preamble in said OFDM radio transmission.

5. (Original) The method of Claim 1, wherein the step of using a cost function generally conforms to

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$$C(\hat{v}) = |V_0 X_{\hat{v}}|^2 = \left| \sum_{n=0}^{63} x(n) e^{-j2\pi \frac{\hat{v}}{F_s} n} \right|^2$$

6. (Currently Amended) The method of Claim 1, wherein the step of sampling is such that [said]a signal subspace is spanned by a set of 52 row vectors derived from a 64x64 square matrix associated with a 64-element discrete Fourier transform wherein [said]a non-signal subspace is spanned by a set of 12 row vectors also derived from the 64x64 square matrix associated with the 64-element discrete Fourier transform and wherein two of these vectors are real[,].

7. (Currently Amended) The method of Claim 1, wherein the step of sampling is such said OFDM radio transmission is typically measured in 16-bit I/Q samples every 0.05 μS, and overall can be mathematically modeled as,

$$x(n) = A(n)e^{j\Phi(n)+j2\pi\frac{v}{F_s}n+j\varphi} + \eta(n)$$

where,

$\Phi(n)$: long preamble phase
v: residual frequency offset
φ: phase offset
$\eta(n)$: additive white Gaussian noise (AWGN).

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8. (Currently Amended) A method for fine frequency-offset error determination in a radio receiver, comprising the steps of:

sampling an OFDM radio transmission, wherein fifty-two non-zero equal magnitude subcarrier measurements are obtained that collectively represent a reference signal comprising a signal subspace and a non-signal subspace, and is such said OFDM radio transmission is typically measured in 16-bit I/Q samples every 0.05 μS, and overall can be mathematically modeled as,

$$x(n) = A(n)e^{j\Phi(n)+j2\pi\frac{v}{F_s}n+j\varphi} + \eta(n)$$

where,

$\Phi(n)$: long preamble phase
v: residual frequency offset

φ: phase offset [;]
η(n): additive white Gaussian noise (AWGN);

determining a coarse frequency offset of said OFDM radio transmission;

compensating any coarse frequency offset determined in a previous step to at worst approximately ±10 kHz;

finding a timing reference boundary between a short preamble and said long preamble in said OFDM radio transmission;

assuming a coarse frequency offset after compensation by a previous circuit will not exceed approximately ±10 kHz; and

using a cost function to determine a fine-frequency offset of said OFDM radio transmission for use in a subsequent circuit providing for frequency compensation of any fine-frequency offset, wherein said cost function generally conforms to

$$C(\hat{v}) = |V_0 X_{\hat{v}}|^2 = \left|\sum_{n=0}^{63} x(n) e^{-j2\pi \frac{\hat{v}}{F_s} n}\right|^2 .$$

9. (Currently Amended) The method of Claim [1]8, wherein the step of sampling is such that [said]a signal subspace is spanned by a set of 52 row vectors derived from the 64x64 square matrix associated with the 64-element discrete Fourier transform wherein [said]a non-signal subspace is spanned by a set of 12 row vectors also derived from the 64x64 square matrix associated with the 64-element discrete Fourier transform and wherein two of these vectors are real[,].